

only be overcome by the scientific agronomist, aided by the best practical botany and chemistry.

Since sending the above paper I have received the *Revue Scientifique*, of February 5, 1887, containing a notice of the observations of Girard on the production of carbohydrates in plants. This author definitely confirms my statements in respect of the independent formation of sucrose in leaves. The reviewer says:

"Les expériences de M. A. Girard mettent hors de doute que les limbes fabriquent alors des saccharose et des sucres réducteurs."

M. Girard shows the possibility of leaves developing starch from sucrose, but there appears to be no evidence that the reverse of this operation takes place.

Notes on Umbelliferae of E. United States. II.

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(WITH PLATE II.)

ANGELICA L.—Fruit strongly flattened dorsally, broadly winged at the commissure: carpel with 5 strong primary ribs, each with a group of strengthening cells,¹ the 2 lateral extended into broad wings, distinct from those of the other carpel, forming a double-winged margin to the fruit: oil-ducts one to several in the intervals or indefinite, 2 to 10 on the commissural side (figs. 14-18).—Stout perennials, with ternately or pinnately compound leaves, large terminal umbels, scanty or no involucre, small many-leaved involucels, and white or greenish flowers.—Incl. *Archangelica* Hoffm., excl. *A. Gmelini* DC.—*Archangelica* is referred to *Angelica* by Maximowicz, Bull. Acad., Petersb., 19. 273. The only characters serving to separate *Archangelica* from *Angelica* break down. The number of oil-ducts in the intervals, while usually one in *Angelica*, in *Angelica Curtissii* may be two, or even three, as well in the dorsal intervals as in the lateral; while in *Archangelica hirsuta* the oil-ducts may be reduced to one or two in the intervals. The generic relation of neither of these species can be determined by any character drawn from the oil-ducts, and plac-

¹In January GAZETTE, p. 14, third sentence from bottom, in contrasting the characters of *Angelica* and *Conioselinum*, the last clause ("especially conspicuous under the lateral ribs") might be understood to refer to *Conioselinum*. It refers to *Angelica*.

ing *Angelica Curtissii* and *Archangelica hirsuta* together the other *Archangelicas* must follow. Also, the adherence of the seed to the pericarp is hardly a usable character, as in *Archangelica hirsuta* it becomes loose very tardily, and in most (even mature) specimens appears as completely adherent as in *Angelica Curtissii*. Sometimes the same is true in *A. dentata* also. *Archangelica Gmelini* we do not consider a member of *Angeliceæ* at all.

* Seed adherent to pericarp: oil-ducts one to several in the intervals: uppermost leaves mostly reduced to large inflated petioles.

1. *A. Curtissii* Buckley, Am. Jour. Sci. 1. 45. 173. Smooth: leaves twice ternate or the divisions quinate; leaflets thin, ovate-lanceolate (1 to 3 in. broad), sharply and irregularly toothed: fruit smooth ($1\frac{1}{2}$ to 3 lines broad); oil-ducts mostly one in the intervals (sometimes 2 or 3), 2 to 6 on the commissural side (figs. 14, 15).—Along the Alleghanies from Pennsylvania to N. Carolina. Fl. August.

2. *A. hirsuta* Muhl. Cat. 2 ed. 30. Pubescent above: leaves twice pinnately or ternately divided; leaflets thickish, lanceolate to oblong (5 to 10 lines broad), serrate: fruit pubescent (2 lines broad); oil-ducts 3 to 6 in the intervals (sometimes 1 or 2), 6 to 10 on the commissural side (fig. 16).—*Archangelica hirsuta* Torr. & Gray, Fl. 1. 622; Chapman, 164; Gray, Manual, 193. *Angelica triquinata* Nutt. Genera, 1. 186.—Dry ground, New York to Minnesota, and southward to Tennessee and Florida. Fl. July.

* * Seed loose in pericarp: oil-ducts indefinite, somewhat evenly distributed, under the ribs as well as in the intervals: upper petioles not so prominent.

3. *A. dentata*. Slender, smooth: leaves ternate, with long slender petioles and few leaflets, which are small, lanceolate, coarsely toothed: umbels slightly pubescent: fruit smooth or pubescent; oil-ducts about 20, with 8 on the commissural side (fig. 17).—*Archangelica dentata* Chapman, Torr. & Gray, Fl. 1. 622; Flora, 164.—Dry pine barrens, Florida. Fl. July to September.

4. *A. atropurpurea* L. Spec. 251. Very stout, smooth, with dark purple stem: leaves 2 to 3-ternately divided; segments of 5 to 7 leaflets, which are lanceolate to ovate (1 to $1\frac{1}{2}$ in. broad), sharply cut mucronate-serrate: umbels smooth: fruit smooth; ribs larger and with much more conspicuous

groups of strengthening cells; oil-ducts 25 to 30, with 8 to 10 on the commissural side (fig. 18).—*Archangelica atropurpurea* Hoffm. Umbel. 161; Gray, Manual, 193.—Low riverbanks, from New England to Pennsylvania, Minnesota, and northward. Fl. June.

CÆLOPLEURUM Ledeb.—Fruit globular-ovoid, round in section, or slightly flattened laterally: carpel with 5 very prominent thick corky primary ribs, about equal and none of them winged, each with a large group of strengthening cells: oil-ducts 1 in each interval, 1 (rarely 2) under each rib, and 2-4 on the commissural side: seed loose in the pericarp, plane or slightly concave on the inner face (figs. 19, 20).—Stout perennial, with 1-3-ternately divided leaves, few-leaved involucre and involucels, and greenish-white flowers. Fl. July.—The genus is well marked by its fruit characters. It clearly differs from the whole group of Angeliceæ in the absence of lateral wings, and in the fruit not being at all dorsally flattened. The flattening, if any, is slightly lateral, as in *Ligusticum*. From *Ligusticum* it differs in its very large ribs and single oil-duct in each interval; from *Selinum* in that it has oil-ducts beneath the ribs as well as in the intervals. It was referred by Bongard to *Pleurospermum*, but differs in having oil-ducts beneath the ribs, and in the face of the seed being mostly plane or very slightly concave.

1. *C. Gmelini* Ledeb. Fl. Ross. 2. 361. Stem 1-3 ft. high: leaflets ovate, acute, cut-serrate.—*Archangelica Gmelini* DC; Gray, Manual, 193. *A. peregrina* Nutt.—New England and northward, also in the Rocky Mountain region.

ÆTHUSA L.—Fruit ovate-globose, slightly flattened dorsally: carpel with 5 thick sharp primary ribs and no strengthening cells except in very tips of the ridges: oil-ducts one in each interval and two on the commissural side (figs. 21, 22).—Poisonous annuals, with 2 to 3-ternately compound leaves, divisions pinnate, ultimate segments small and many cleft, no involucre, long narrow involucels, and white flowers in July.

1. *Æ. Cynapium* L. A fetid, poisonous European herb, in cultivated grounds, from New England and Pennsylvania to Minnesota.

CONIUM L.—Fruit ovate, flattened laterally: carpel with 5 prominent wavy primary ribs, each with a large

bundle of strengthening cells: oil-ducts none, but a layer of secreting cells next the seed: seed deeply and narrowly concave on the inner face (figs. 23, 24).—Poisonous biennials, with spotted stems, large decomposed leaves with lanceolate pinnatifid leaflets, narrow-leaved involucre and involucels, and white flowers in July.

1. *C. maculatum* L. A large branching European herb, in waste places throughout the Northern States.

POLYTÆNIA DC.—Fruit obovate to oval, much flattened dorsally: carpel with 5 primary ribs, the dorsal and intermediate small or obscure in the depressed back, the lateral forming broad thick corky wings closely contiguous to those of the other carpel and forming the margin of the fruit: oil-ducts 12 to 18 about the seed (4 to 6 on commissural side) and many scattered through the thick corky pericarp, which also contains 5 small bundles of strengthening cells: seed-section variable, oval or much flattened (figs. 25, 26).—Perennial, mostly glabrous herbs, with twice pinnate leaves (upper opposite and 3-cleft), segments cuneate and incised, no involucre, narrow involucels, and bright yellow flowers in May.

1. *P. Nuttallii* DC. Mem. Umbel. 53. t. 13. Plant 2 to 3 feet high: pedicels and involucels pubescent.—Michigan to Louisiana and westward.

EXPLANATION OF PLATE II.—Fig. 14, Fruit of *Angelica Curtissii*, $\times 7$. Fig. 15, Section of carpel of same, $\times 20$. Fig. 16, Section of carpel of *A. hirsuta*, $\times 20$. Fig. 17, Section of carpel of *A. dentata*, $\times 20$. Fig. 18, Section of carpel of *A. atropurpurea*, $\times 20$. Fig. 19, Fruit of *Cœlopleurum Gmelini*, $\times 7$. Fig. 20, Section of carpel of same, $\times 20$. Fig. 21, Fruit of *Æthusa Cynapium*, $\times 10$. Fig. 22, Section of carpel of same, $\times 20$. Fig. 23, Fruit of *Conium maculatum*, $\times 7$. Fig. 24, Section of carpel of same, $\times 20$. Fig. 25, Fruit of *Polytænia Nuttallii*, $\times 3\frac{1}{2}$. Fig. 26, Section of carpel of same, $\times 20$.

BRIEFER ARTICLES.

Carex notes.—*Carex glaucoidea* Tuckerm., which W. Boott, Esq., has recently referred to *C. grisea*, has an even, strongly curved style, completely separating it from the latter, and also from *C. flaccosperma*, which has an even, straight style. "Bulbous thickened" does not accurately describe the style of *C. grisea*, as it is often merely thickened above the base as in *C. oligocarpa*. But this character is sufficiently marked to disconnect it from the others mentioned. Judged by external characters only, these three species sometimes closely approach each other, but their styles are permanently different.—E. C. HOWE, *Lansingburg, N. Y.*